# NIKHIL VERMA

**Biomedical Engineering PhD Program** 

+1-646-309-0486 | website: vermanikhil.github.io | vermanikhil96@gmail.com | www.linkedin.com/in/nikhil-verma-bme

### **Fields of Interest**

Brain-Computer Interface, Neural Engineering, Artificial Intelligence, Neuroprosthetics, Signal Processing.

### **Education**

### National Institute of Technology, Raipur

BACHELOR'S IN TECHNOLOGY (B. TECH)

Department Rank 3

**Experience** 

### Rehabilitation Neural Engineering Lab, University of Pittsburgh

RESEARCH FELLOW (Advisor: Dr. Douglas Weber, Dr. Jennifer Collinger)

#### Portable Brain Computer Interface system

Developed software and graphical user interface for Portable intracortical BCI system

· Evaluated the Usability and User Experience and compared systems performance with touch input.

#### EMG controlled ankle-foot neuroprosthesis

- · Developed machine learning model to classify Gait phases from EMG+IMU and only EMG data in healthy controls
- Examined the differences in muscle recruitment between the intact and residual limbs with the aim of characterizing voluntary recruitment patterns.
- · Examined spacio-temporal differences in muscle recruitment in residual limb using high density EMG.
- · Developing real-time continuous decoder of angular velocity using EMG.

### **MIT Media Lab**

SUMMER RESEARCH STUDENT | KHORANA SCHOLAR

· Developed signal processing and machine learning algorithms to detect sleep stage using various biosignals (Project Dormio)

### **Siemens Healthineers**

BIOMEDICAL ENGINEERING INTERN
Resolved technical issues for various medical devices like CT-16 slices, 1.5T MRI, 3-D and Dual display C-Arm.

### All India Institute of Medical Sciences (AIIMS)

**RESEARCH INTERN** 

 Collaborated with the neurophysiologist to work on a technique to augment sleep- Engineering Sleep. Primarily worked on Sleep Stage detection using EEG and Signal Processing.

### **Projects**

### Tadashi- Your Personal Healthcare Companion

Computer Vision, Deep Learning, OpenCV, TensorFlow, Keras

This system identifies and monitors the food intake of the user and gives a feedback on his food lifestyle. This feedback includes immediate and weekly feedback which help in decision making, self-realization and provides the user with an additional motivation to continue with a healthy lifestyle.

### Sparsh- Restoring Tactile Sensation in Upper Limb Amputees

ADVISOR: PROF. BIKESH KUMAR SINGH (BACHELOR THESIS PROJECT-1)

This project creates an opportunity for upper limb amputees to obtain a sensory feedback by stimulating the peripheral nerves in their residual limb giving them the sensation of touch in different fingers and completing the loop in human-machine interfaces.

### Dormio- Interfacing with Dreams to Augment Human Creativity

ADVISOR: PROF. PATTIE MAES

This system allows for access to semi-lucid sleep states that can successfully influence, extract information from, and leverage cognition happening during the early stages of sleep to augment human creativity.

Biomedical Engineering CPI: 8.83/10.0

Pittsburgh, PA

Mav 2019 - Present

#### May 2018 - July 2018

Boston, MA

### Indore, India

December 2017 - January 2018

#### Raipur, India

May 2017 - July 2017

Banglore, India

### Raipur, India

August 2018 - December 2018

December 2018 - February 2019

#### Boston,MA

*May* 2018 - July 2018 formation from, and leverage

### **BrainSense- Mind Controlled Robot**

ADVISOR: PROF. R. PERIYASAMY

This project acts as an inception for developing a vehicle, or wheelchair allowing patients with motor disability to control it using their minds through Brain-Computer Interfaces.

### **Engineering Sleep-Sleep Monitoring and Manipulation Setup**

ADVISOR: DR. MEENAKSHI SINHA

The vision was to establish a system for measuring cerebral activity to recognize deep sleep by detection of delta waves and stimulate synchronized auditory signals to enhance the quality of sleep and improve memory.

### Small Mouth- Autonomous Bio-Mimetic Marine Drone

ADVISOR: PROF. ARINDHAM BIT

This model provides an engineering tool for practical applications in marine and military fields, such as monitoring the environment, harvesting natural resources, undersea operation, etc.

### Presentations, Papers and Posters

- Nikhil Verma, Isaiah Levy, Dev Sarma, Paige Paulus, Bailey Petersen and Douglas J. Weber "Bilateral symmetry in anklemuscle activation in transtibial amputees" (2020) 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC) – (Submitted)
- Nikhil Verma, Jeffrey Weiss, Jennifer Collinger "Evaluation of a portable intracortical BCI system according to user-centered design principles" (2019) Second Carnegie Melon Forum on Biomedical Engineering
- Engineering Sleep, Physio-CME 2017, Department of Physiology AIIMS, India
- BrainSense, Vigyaan, The National Science Exhibition 2017
- BrainSense, IEEE Skills and Knowledge Enhancement Program
- Smallmouth, Vigyaan The National Science Exhibition 2016

### Honors and Awards

- Awarded Khorana Scholarship 2018 to work at a lab in the US for the summer of 2018, amongst 40 students from India.
- Awarded Indian Academy of Science's Summer Research Fellowship 2018
- Awarded Health Science Research Fellowship 2019 at the University of Pittsburgh.
- Secured a spot in the top 20 teams from India in GE Healthcare Precision Challenge 2018
- Winners in Vigyaan, The National Science Exhibition-2017.
- · Runners up in IEEE Skill and Knowledge Enhancement Programme.
- · Runners up in Vigyaan, The National Science Exhibition-2016.
- Won Bronze medal in State level Roller Hockey competition.

### **Skills**

Software	Python, MATLAB, LabVIEW, C, C++, LaTeX

Hardware Arduino, RasperryPi, Cura, SketchUp, Multisim

Libraries NumPy, Pandas, TensorFlow, Keras, OpenCV

## Raipur. India

#### August 2016 - October 2016

May 2017 - June 2017

### Raipur, India

Raipur, India

### August 2017 - October 2017